

## REMARKS

Applicant respectfully requests reconsideration of the instant application on the basis of the original Claims. Claims 1, 14 and 27 are the main claims and the remaining claims are directly or indirectly dependent upon those.

The Examiner has maintained the rejection of the claims as being unpatentable over U.S. Patent No. 5,495,576 by Ritchey (*Ritchey*) in view of U.S. Patent No. 5,583,795 by Smyth (*Smyth*) and U.S. Patent No. 6,580,448 B1 by Stuttler (*Stuttler*). It is believed that Claims 1 to 36 are clearly distinguishable over these 3 references for the reasons that will be set forth.

### 35 U.S.C. § 103 Grounds for Rejection

The Examiner rejected Claims 1-39 under 35 U.S.C. § 103(a) as being unpatentable mainly over *Ritchey* in view of *Smyth* and *Stuttler*. Applicants respectfully traverse these rejections for the reasons discussed below.

Applicants respectfully suggest that the Examiner's characterizations of the *Ritchey* and *Smyth* references in the subject Office Action are wrong and wholly without support in the record and the cited references.

As Applicants stated in an earlier paper, the *Ritchey* reference describes a system that combines information from multiple sensors to generate a computer model of a scene -- "information fusion". The *Ritchey* disclosure does not describe an "image fusion" system, where multiple images of the same scene are combined to present a single image to the user. As such, perceptual issues such as eliminating parallax between sensors (to simulate a true monocular image) or eliminating parallax between the eye and sensors (to give the user the perception of directly viewing the image) are not relevant to the *Ritchey* or *Smyth* inventions.

Additionally, *Ritchey* teaches a combination of three sensors. Two sensors are associated with the user's left and right eyes and a third sensor (76a) is associated with the user's head. Col. 24, lines 36-67. To be noted, *Ritchey* teaches specifically that "[t]wo images are calculated so as to present a stereoscopic view of the virtual model 14a corresponding with what would be seen if the virtual model were a real object from the helmet wearer's current standpoint." Col. 24, lines 58-61. [Emphasis added]

Further, *Ritchey* teaches no "securing means attached to the sensor unit for mounting the sensor unit to the head adapter" whereby the sensor unit has "at least a first and second sensor arranged along a sensor axis." *Ritchey's* two sensors are located along the ocular axis and teaches only the separate third "head sensor" that can be located somewhere other than along the optical axis of the user who is wearing a "helmet." *Ritchey* uses the term "head sensor," but fails to suggest that this is a sensor that is either mounted with the head or anything other than a "primary" sensor representative of a head in the computer generated world model (Col. 24, line 36). Figure 16 of *Ritchey* arguably shows the head sensor 76a in proximity to the head, but separate therefrom. See also Col 25, lines 15-21. There is no linkage whatsoever between *Ritchey's* third, separate head sensor and a head adapter to mount the sensor unit.

The result is that *Ritchey* teaches only that there are two sensors associated with a right eye and a left eye and a third "head sensor" associated somewhere with a helmeted user. That is the extent of the teaching of *Ritchey*.

The *Smyth* reference is simply a head-mounted gaze-tracking system. Other than being head-mounted, it is not relevant to the *Ritchey* disclosure or to the present invention. Unlike the present invention, the location of the head-mounted gaze tracker is not related to image perception, left-right eye interchangeability, or weight balancing. The sensor utilized in the *Smyth*

device is aligned in the line of sight of the eye of the use in order to receive reflections from the eye.

Applicants further respectfully disagree with the characterization of *Smyth* by the Examiner on page 3 of the subject Office Action.

Applicants assert that *Smyth* does not teach a "sensor axis when the sensor unit is secured to the user with the head adapter element [being] essentially perpendicular to the user's ocular axis (Col. 10, Line 55 to Col. 11, Line 18)" as stated by the Examiner on page 3 of the Office Action.

Admittedly *Smyth* mentions an orthogonal set of coordinate axes perpendicular to the ocular axis (Col. 11, lines 17-18), but this orthogonal set of axes is ONLY in reference to a set of axes to determine the roll of the eye. Nowhere in the portion of *Smyth* cited by the Examiner is there a mention or even the slightest suggestion of a "sensor unit being mounted above an ocular axis formed between a pair of eyes of the user when the sensor unit is attached to the head adapter element" as claimed in the instant application.

There simply is no teaching in *Smyth* upon which the Examiner may rely for the stated justification to reject the claims in view of *Smyth*.

With respect to *Stuttler*, *Stuttler* describes a system that reproduces the view of an observer's gaze. Nowhere does *Stuttler* teach or suggest a system that combines 2D visible and 2D infrared (Fused Imagery) into a 2D view of the scene as in the present invention. The present invention does point to the fact that the night vision device does not reproduce an observer's line of sight in the system's line of sight. Since this is precisely what *Stuttler* is trying to avoid, *Stuttler* teaches away from the present invention.

Thus, the *Ritchey*, *Smyth* and the present invention have different functions, and one of ordinary skill in the art would not have been motivated to substitute *Smyth*'s securing means for mounting a sensor unit to a head adapter with a man-portable sensor-fusion system, since its function is not related to image perception or weight balancing.

In order to establish a prima facie case of obviousness, the prior art teachings must be sufficient to suggest making the substitution or modification necessary to make the claimed invention to one of ordinary skill in the art. It is also a critical inquiry whether there is something in the prior art as a whole to suggest the desirability of making the combination.

There must have been a reason apparent at the time the invention was made to a person of ordinary skill in the art for applying the teachings at hand to effect the modification necessary to reach the claimed invention in the manner proposed or the use of the teaching as evidence of obviousness will entail prohibited hindsight. Graham v. John Deere of Kansas City, 383 U.S. 1, 148 USPQ 459 (1966), and In re Nomiya, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

Here there is lacking the requisite suggestion in these prior art disclosures that would have motivated the artisan to do what the Examiner has characterized as being an obvious combination. Applicants respectfully suggest that the Examiner's characterizations of *Ritchey* and *Smyth* are simply wrong based on the literal reading of the cited references.

Independent Claim 1 recites the following elements, the most pertinent to this discussion being presented in bold type for the convenience of the Examiner:

1. A man-portable sensor fusion system comprising:
  - sensor unit having at least a first and second sensor arranged along a sensor axis;
  - head adapting means for providing support to mount at least one selected device about a user's cranium; and,
  - securing means attached to the sensor unit for mounting the sensor unit to the head adapter; **the sensor unit being mounted above an ocular axis formed between a pair of eyes of the user when the sensor unit is attached to the head adapter element; the sensor axis when the sensor unit is secured to the user with the head adapter element is essentially perpendicular to the user's ocular axis.**

Applicant respectfully submits that the combination of *Ritchey* with *Smyth* does not disclose, teach, or suggest that the sensor unit is mounted above an ocular axis formed between a pair of eyes of the user when the sensor unit is attached to the head adapter element and that the sensor axis when the sensor unit is secured to the user with the head adapter element is essentially perpendicular to the user's ocular axis as recited by Claim 1. As conceded by the Examiner, *Ritchey* "fails to recite [an] ocular axis." Instead, as noted by the Examiner, *Smyth* discloses an ocular axis, but *Smyth* teaches that the sensor 2b is in the ocular axis or line of sight in order that the sensor can receive reflections from the eye. See Col. 6, lines 11-13, and Figure 3. That there are arbitrary orthogonal axes to determine the roll of the eye disclosed by *Smyth* teaches nothing relevant or helpful to the present invention. Therefore, Claim 1 is not obvious in light of the cited art and Applicants respectfully submit that this rejection should now be withdrawn.

Any combination of *Ritchey* and *Smyth* based on the disclosures in the references fails to teach or suggest these claim elements.

By the present structure Applicants are able to achieve the advantages which have hitherto not been achievable through any adaptation of the prior art. It is therefore believed to be clear that the particular structure of Applicants is extremely important and is not a mere matter of design. It should also be noted that the *Ritchey* reference has been available since February 27, 1996 and the *Smyth* reference has been available since December 10, 1996. Between that time and the present, no one except Applicants have constructed a man-portable sensor system with the sensor unit being mounted above an ocular axis formed between a pair of eyes of the user when the sensor unit is attached to the head adapter element and the sensor axis, when the sensor unit is secured to the user with the head adapter element, is essentially perpendicular to the user's ocular axis, without the disadvantages discussed above and which are clearly set forth on the first few pages of Applicants' specification. It is certainly believed to be pertinent that no one has achieved or anticipated Applicants' structure despite the availability of the reference.

To the extent that this rejection is maintained by the Examiner, Applicants respectfully requests that the Examiner specifically identify the particular portion in the reference or knowledge upon which such a continuing rejection is maintained.

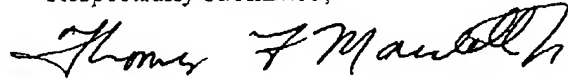
The remaining Dependent Claims that depend from independent Claims 1, 14, or 27 are also not made obvious by *Ritchey* in view of *Smyth* because they include the limitations of Claims 1, 14, or 27 and add additional elements that further distinguish the art. Therefore, Applicant respectfully requests that Claims 1-36 be allowed.

### Conclusion

Applicant has now made an earnest attempt to place this case in condition for allowance. In light of the remarks set forth above, Applicant respectfully requests reconsideration and allowance of Claims 1-36.

If there are matters which can be discussed by telephone to further the prosecution of this Application, Applicant invites the Examiner to call the attorney at the number listed below at the Examiner's convenience.

Respectfully submitted,



Thomas F. Marsteller, Jr.  
Registration No. 29,672

Marsteller & Associates, P.C.  
PO Box 803302  
Dallas, TX 75380-3302  
(972) 233-0939  
(972) 386-3907 (Fax)

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